

WHAT IS CLAIMED:

1. A method of forming a conductive pattern in a mold layer, the method comprising:
 - 5 removing a portion of a barrier layer outside an intaglio pattern in a mold layer to expose an upper surface of the mold layer and avoiding removing a portion of the barrier layer on the intaglio pattern;
 - forming a conductive layer on the portion of the barrier layer on the intaglio pattern and on the upper surface of the mold layer; and
 - 10 removing the conductive layer from the upper surface of the mold layer.
2. A method according to Claim 1 wherein the barrier layer comprises a first barrier layer, the mold layer comprises a first mold layer, the intaglio pattern comprises a contact hole in the first mold layer, and the conductive layer comprises a
 - 15 first conductive layer, the method further comprising: - forming a groove in a second mold layer on the first mold layer, the groove being disposed above the first conductive layer in the contact hole;
 - forming a second barrier layer on an upper surface of the second mold layer and in the groove;
 - 20 forming a flowable material on the second barrier layer;
 - removing a portion of the flowable material and a portion of the second barrier layer outside the groove and avoiding removing a portion of the flowable material and a portion of the second barrier layer inside the groove;
 - removing the portion of the flowable material from inside the groove;
 - 25 forming a second conductive layer on the second barrier layer; and
 - removing a portion of the second conductive layer from outside groove and avoiding removing a portion of the second conductive layer inside the groove.
3. A method according to Claim 1 wherein the intaglio pattern is formed
 - 30 by: - forming a contact hole in the mold layer; and
 - forming a groove in the mold layer above on the contact hole.

4. A method according to Claim 3 wherein forming the conductive layer comprises forming the conductive layer in the contact hole and in the groove.

5. A method according to Claim 3 wherein forming the contact hole and forming the groove comprises:

sequentially forming a first interlayer dielectric and a second interlayer dielectric on a substrate;

patterning the second interlayer dielectric to form a groove exposing a predetermined region of the first interlayer dielectric; and

10 patterning the exposed first interlayer dielectric to form a contact hole exposing a predetermined region of the substrate, wherein the first and second interlayer dielectric layers comprise the mold layer.

6. A method according to Claim 1 wherein the barrier layer comprises at least one material selected from the group consisting of Ti, Ta, TiN, Ti/TiN, TaN, Ta/TaN, and WN.

7. A method according to Claim 2 wherein the flowable material layer comprises a material having an etch selectivity with respect to the mold layer.

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8. A method according to Claim 7 wherein the flowable material layer comprises a photoresist.

9. A method according to Claim 8 wherein the flowable material is removed using a developer.

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10. A method according to Claim 8 wherein the flowable material is removed by an ashing process.

11. A method according to Claim 8 wherein the flowable material layer comprises SOG (spin on glass).

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12. A method according to Claim 11 wherein the flowable material pattern is removed using either one of a phosphoric acid containing solution and a fluoric acid containing solution.

5 13. A method according to Claim 1 wherein the conductive layer comprises aluminum.

14. A method according to Claim 13 wherein forming the conductive layer comprises forming the aluminum layer by chemical vapor deposition (CVD) or
10 sputtering.

15. A method according to Claim 14 wherein forming the aluminum layer further comprises:
performing a reflow process for a substrate including the deposited aluminum
15 layer.

16. A method according to Claim 1 wherein the conductive layer comprises one of copper and tungsten.

20 17. A method according to Claim 1 after forming the conductive layer: planarizing the conductive layer to expose the upper surface of the mold layer to form a metal pattern in the intaglio pattern.

18. A method according to Claim 17 wherein planarizing the conductive
25 layer comprises planarizing using a chemical mechanical polishing (CMP) process.

19. A method of forming a conductive pattern in a mold layer, the method comprising:
forming a contact hole in a first mold layer on a lower conductive pattern;
30 forming a first barrier layer in the contact hole and outside the contact hole on an upper surface of the first mold layer;
forming a first flowable material on the barrier layer;

- removing the first flowable material to expose the upper surface of the first mold layer and to avoid removing the first flowable material from inside the contact hole;
- removing the first flowable material from inside the contact hole;
- 5 forming a first conductive layer in the contact hole and on the exposed upper surface of the first mold layer;
- removing the first conductive layer to expose the upper surface of the first mold layer and to avoid removing the first conductive layer from inside the contact hole;
- 10 forming a second mold layer on the first mold layer;
- forming a groove in the second mold layer on the contact hole;
- forming a second barrier layer in the groove and outside the groove on an upper surface of the second mold layer;
- forming a second flowable material on the second barrier layer;
- 15 removing the second flowable material to expose the upper surface of the second mold layer and to avoid removing the second flowable material from inside the groove;
- removing the second flowable material from inside the groove;
- forming a second conductive layer in the groove and on the exposed upper
- 20 surface of the second mold layer; and
- removing the second conductive layer to expose the upper surface of the second mold layer and to avoid removing the second conductive layer from inside the groove.
- 25 20. A method of forming a conductive pattern in a mold layer, the method comprising:
- forming a contact hole in a mold layer on a lower conductive pattern;
- forming a groove on the contact hole, the groove being wider than the contact hole;
- 30 forming a barrier layer in the groove and outside the groove on an upper surface of the mold layer;
- forming a flowable material on the barrier layer;
- removing the flowable material to expose the upper surface of the mold layer and to avoid removing the flowable material from inside the groove;

- removing the flowable material from inside the groove;
 - forming a conductive layer in the groove and on the exposed upper surface of the mold layer; and
 - removing the conductive layer to expose the upper surface of the mold layer
- 5 and to avoid removing the conductive layer from inside the groove.